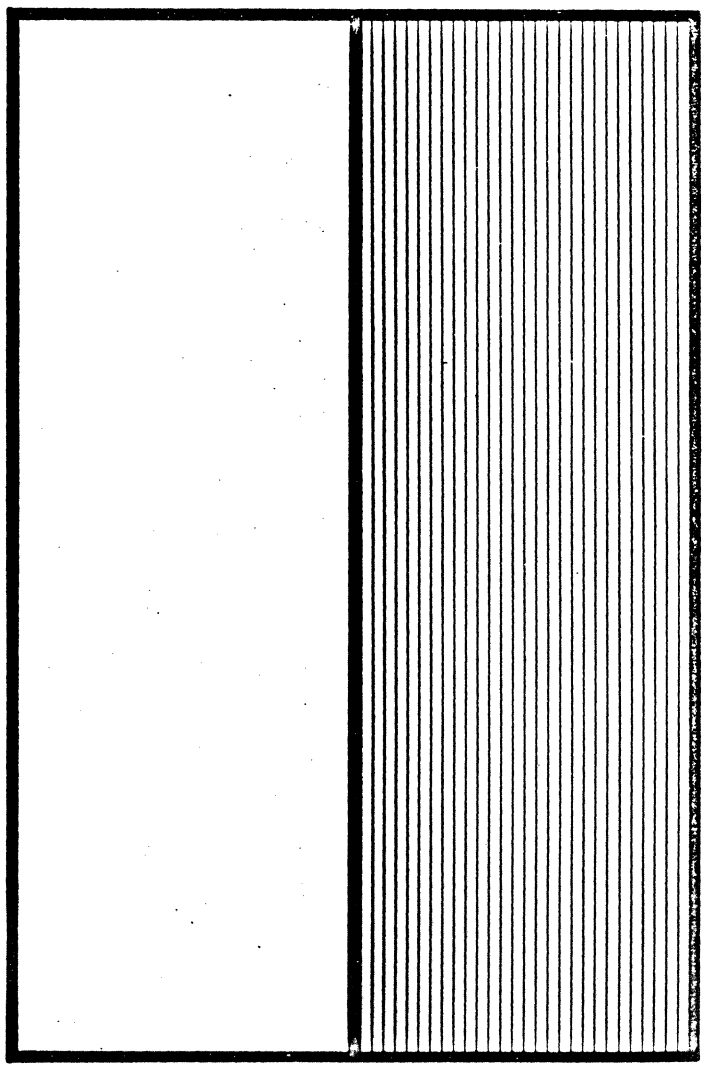
4091717

SPERRY RAND

UNIVAC 9400 SYSTEM

PROGRAM DESCRIPTION DRAWING



CUSTOMER ENGINEERING

REVISION STATISTICS RECORD

4091717

DWG REV	MSTR REV	RELEASE DATE	DESIGNER NAME	EIR NUMBER	FCO NUMBER
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SPERRY RAND UNIVAC

DRAWING NO. 4091717

REVISION -

CUSTOMER ENGINEERING
PRODUCT DIAGNOSTIC SOFTWARE

9400 - 5024/8424 or 8425 Disc Dual Access Test D2150

	SIGNATURE	TITLE	DATE
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REVISION DESCRIPTION RECORD

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Dual Access - D4150

1. INTRODUCTION

1.1 Purpose. This document describes a 9400 test program for the 5024/8424 Disc Subsystem.

1.2 Major Objectives. The objective of this program is to test the Dual Access feature utilizing as many other features of the 5024/8424 as possible. Test organization and operator options are intended to satisfy the needs of Quality Control personnel in checkout on acceptance and maintenance activities.

1.3 Equipment Configurations. All equipment configurations must be connected to a Selector I/O Channel of the 9400 Processor. This test routine will operate with the following equipment configurations.

- Disc File Control - Type 5024
- Dual Access Control - F1043
- Disc Drive - Type 8424 or 25
- Disc Pack Assembly - Type F1214-01

1.4 Associated Software. This program has DSKH included as an integral part of the program. This is the standard disc handler used by all Disc Maintenance test programs. It is the interface between the program and MCP, which performs program load, parameterization, execution, deletion, I/O handling, and message handling.

2. FUNCTIONAL DESCRIPTION

2.1 General Organization. This program tests the Dual Access Feature of the 5024/8424 Disc Subsystem. Various sized Write and Read Track Descripter Record and Write and Read commands are executed. Writing and reading of various size records using Data and Key-Data function commands are tested. Multiple track operations are tested. Setting the Select Flip-Flop in the Control Unit is tested with the Recal and Write commands.

2.2 Program Description

2.2.1 Test 1 (Group Test)

2.2.1 Cont'd.

Objective. The objective of test 1 is to enable several tests to be internally selected simply by entering subtest 1. Test 1 selects tests 2 through 9.

Method. The program places bits into the parameter location which tells DSKH which test to enter.

2.2.2 Test 2 (Test Read Busy During Write)

Objective. Verify that device n is busy through Control Unit 2 while writing long Track Descriptor Record through Control Unit 1.

Method:

a. Write a normal RO on CU1 DO.
b. Attempt a read RO on CU2 DC during a.
c. After a normal end of a, read RO on CU2 DO.
d. Verify data read.
e. Recal CU2, issue same sequence on CU2, steps a through d. Verify no NSI on CU2. Repeat for CU1.
f. Repeat a through e.
g. Repeat a through f 5 times.
h. A through g shall be run on each device.

2.2.3 Test 3 (Read/Read Test)

Objective. Verify that device n is busy through Control Unit 2 while reading a long Track Descriptor Record through Control Unit 1.

Method:

a. Write a long RØ (7200 byte) on CU1 DØ
b. Read RØ on CU1 DØ
b/b Attempt to read RØ on CU2 DØ
c. After normal end of b, verify data
d. Read RØ on CU2 DØ
e. After normal end of d, verify data
f. Swap channel addresses on CU1 and CU2
g. Repeat a through f
h. Repeat a through g 5 times
i. A through h shall be run for each device

2.2.4 Test 4 (Erase Lockout Test)

2.2.4 Cont'd.

Objective. Verify that device n is busy through channel 2 due to Erase Lockout after write short TD record through channel 1.

Method:

a. Write a normal RØ on CU1 DØ. Verify that the DØ is busy through CU2. An interrupt on CU1 or CU2 will be an error.
b. Read and verify data after normal end of CU1 write
c. Read and verify data CU2 DØ
d. Swap channel addresses on CU1 and CU2
e. Repeat a through d
f. Repeat a through e 5 times
g. A through f shall be run for each device

2.2.5 Test 5 (Multitrack Operation)

Objective. Verify that device n is busy through Control Unit 2 during a multi-track search and write on Control Unit 1.

Method:

a. Issue a read CU1 DØ. Don't allow end of cylinder to occur.
b. Verify the head position with CU2 via a search ID equal and a read.
c. Swap channel addresses on CU1 and CU2
d. Repeat a through c
e. Repeat a through d 5 times
f. A through e shall be run for each device

2.2.6 Test 6 (End of Cylinder Verify)

Objective. Verify that end of cylinder in device n is set and can be read through both control units following a multi-track search without a find.

Method:

a. Issue a search on CU1 DØ. Wait for end of cylinder.
b. Issue read HA on CU2 DØ. Either missing AM or no record found should be set.
c. Swap channel addresses on CU1 and CU2
d. Repeat a through c
e. Repeat a through d 5 times
f. A through e shall be run for each device

2.2.7 Test 7 (Multitrack Verify)

Objective. Verify that status and head selection occur on device n after multi-track operations on both Control Units.

Method:

a. Issue a long seek on CU1 DØ
a/a Attempt to read CU2 DØ
b. Repeat a/a until accepted
c. Check normal ending status on a
d. Swap channel addresses on CU1 and CU2
e. Repeat a through d
f. Repeat a through e 5 times
g. A through f shall be run for each device

2.2.8 Test 8 (Dual Access - Different Device - Long Record)

Objective. To write, simultaneously, records on two (2) devices, each through separate Control Units. All data is verified on a Write by exchanging Control Units for the Read.

Method:

a. Write many long records on CU1 DØ
a/a Write many long records on CU1 D(Ø + 1)
b. Read and verify data on both devices
c. Repeat a, a/a, and b for each device other than the DØ being used on CU1
d. Swap channel addresses on CU1 and CU2
e. Repeat a through d
f. Repeat a through e 5 times
g. A through g shall be run with each device used on CU1

2.2.9 Test 9 (Dual Access - Different Device - Short Records)

Objective. To write, simultaneously, short records on two (2) devices, each through separate Control Units. All data is verified on a Write by exchanging Control Units for the Read.

Method:

a. Write many short records on CU1 DØ
a/a Write many short records on CU1 D(Ø + 1)
b. Read and verify data on both devices
c. Repeat a, a/a, and b for each device other than the DØ being used on CU1

2.2.9 Test 9 Cont'd.

d. Swap channel addresses on CU1 and CU2
e. Repeat a through d
f. Repeat a through e 5 times
g. A through g shall be run with each device used on CU1

3. OPERATING PROCEDURES

The Disc Handler Routine is used as a standard interface between the test program and MCR. All operating procedures described in the DSKH documentation hold equally well for this program.

3.1 Initialization. See DSKH documentation. The program is called by typing in the name D4150.

3.2 General Parameter info. DSKH documentation (4091702)

3.3 Test Program Messages. The DSKH documentation describes all test entry and exit messages and a standard I/O message. Data errors are detected by the program, and all data error messages are contained in the program. All unique messages printed by D4150 are explained in the following paragraphs.

3.3.1 Test 1 - A simple parameter setting is performed here, so no errors can occur.

3.3.2 Test Program Error Messages

+ Subtest 4

D4150-4 DATA ERROR DVC-dd
EXPT (16 bytes data)
RCD (16 bytes data)

Cause: Incorrect data read from device - dd.

+ Subtest 5

D4150-5 SEARCH FIND ERROR DVC-dd
WROTE (8 bytes data)
READ (8 bytes data)

Cause: Illegal "FIND" on multi-track operation on device dd.

+ Subtest 6, 7

D4150 - 6 or 7 SENSE DATA ERROR
EXPT (6 bytes sense data)
RCVD (6 bytes sense data)

Cause: Occurs when an attempt is made to set a certain sense byte on a given channel/ device and the attempt to read the sense byte on a different channel fails.

General Subtest Error Messages

++ Channel X Busy Too Long - D4150-2
where X = selector channel; s = subtest number.

++ D4150-s DVC dd CSW STATUS NOT BUSY - READ ds
where ds = device status read; s = subtest number.

Cause: Occurs when a selected channel does not return a Busy Status from a command to a device that is being accessed through another channel.

++ D4150-s DVC dd INT # 1, 2 or 3 EXPCT dsl RCVD - ds2
where dsl = status expected; ds2 = status received.

Cause: On a given subtest, all interrupts and status bytes must be returned from a device in a given sequence. If not returned correctly, the above error message is printed to indicate interrupt and sense byte failure.

++ D4150-s INTERRUPT RECEIVED ON JXX - STATUS = ds
where JXX = channel and device number.

Cause: Occurs when unexpected interrupt is received from the system.

++ D4150-s CHAN-XX NOT BUSY FULL TIME
where XX = channel and device number.

Cause: Occurs when the timing for Busy Status is not within specified program limits.

++ D4150-s CHAN-XX STATUS BUSY COUNT = ccc.
should be = ccc.

Cause: Occurs when channel minimum or maximum busy counts do not meet program limits.

++ D4150-s INTERRUPT WHEN EXPECTING BUSY
STATUS CHANNEL 1 = dsl (status byte)
CHANNEL 2 = ds2 (status byte)

Cause: Occurs when an SIO command has been issued and an interrupt is received rather than an immediate status.

++ NO INTERRUPT - CD (channel and device printed)

Cause: Occurs when a command has been accepted by a channel and the channel fails to interrupt within a specified time limit.

++ D4150-s CONTROL UNIT END NOT SET - DS = ds
where s = subtest; ds = device status.

++ D4150-s FORMAT WRITE FAILED - CAW = (channel address word)

++ D4150-s COMMAND REJECT ON DEVICE - XX
where XX = device number.

Cause: Occurs when the command is not accepted by the channel, Control Unit or device.

++ D4150-s TIO on CHANNEL - JXX STATUS = ds
TIO command failed on device and selector channel XX with channel status = ds.

++ D4150-s VERIFY ERROR DVC - dd
WROTE (24 bytes of information)
READ (24 bytes of information)

Cause: Read failure. The 24 bytes of information contain a cylinder and head number, key, data length, record number and 15 bytes of data.

++ VERIFY ERROR DVC = dd

D4150-s

WROTE (16 bytes of data pattern)
READ (16 bytes of data)

Cause: Results when data written on one selector channel and device does not compare with data read on the same device but different channel.

3.4 Test Program Parameters:

Parameters:

J,A CX #CBY-Z Tn,4 V1,3/6.B s

A = Add
CX = Selector Channel #
# = Three digit device designator follows
CBY-Z = Control unit, Subchannel, Drives Y to Z
Tn = Test Number
V = Variables

3.5 Tests:

T1 = Group Test
T2 = Test Read Busy during Write
T3 = Read/Write Test
T4 = Erase Lockout Test
T5 = Multitrack Operation
T6 = End of Cylinder Verify
T7 = Multitrack Verify
T8 = Dual Access - Different Device - Long Records
T9 = Dual Access - Different Device - Short Records